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This contribution is published to honor Prof. Vladimir Chikatunov, a scientist, a colleague and a friend, on the occasion of his 80th birthday.

A review of the weevil genus *Thamiocolus* (Coleoptera: Curculionidae: Conoderinae: Ceutorhynchitae: Ceutorhynchini) from Israel, with notes on some adaptive features of Ceutorhynchini and a new synonymy

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ABSTRACT

A review of and a key to four species of the ceutorhynchine genus *Thamiocolus* Thomson from Israel are presented. *Thamiocolus chikatunovi* n. sp. is described from the western edge of the Samarian and Judean deserts in Israel and from Mount Nebo in Jordan. *Thamiocolus pici* Korotyaev, 1997 is recognized as an Israeli species probably distinct from the very closely related western Anatolian *Th. calcaratus* (A. Schultze, 1901); photographs of the holotype of *Th. calcaratus* are published for the first time. *Thamiocolus wittmeri* Colonnelli, 1975 is recorded for the first time from Jordan. Middle Asian *Thamiocolus hispidirostris* (Iablokov-Khnzorian, 1971) is placed in synonymy with *Th. tataricus* (A. Schultze, 1900). A female very similar to the Turkish *Th. comptus* Colonnelli, 1997 is recorded from Syria, described in detail and illustrated. The tribe Ceutorhynchini and the genus *Thamiocolus* are briefly characterized, with a discussion of the composition of the Israeli *Thamiocolus* fauna and morphological features of its four species.

KEYWORDS: Beetles, Ceutorhynchini, new species, new synonymy, new record, new hosts, Lamiaceae, *Phlomis brachyodon*, *Phlomis viscosa*, identification key, taxonomy, zoogeography.

INTRODUCTION

The supertribe Ceutorhynchitae Gistel, 1848 is distributed almost worldwide and comprises to date over 1400 described species, 1316 of which were listed by Colonnelli (2004). Ceutorhynchitae are small (1.5–5.5 mm) weevils with usually robust body. Adults can place their short to very long (longer than body in some exotic species) rostrum between the coxae when disturbed, the behaviour responsible for the scientific name of the tribe (based on the genus *Ceutorhynchus*, from *ceuto-* (from Greek κεύδείν (to hide, to cover)) and ῥύγχος (rostrum)). Ceutorhynchitae have a set of characters rarely or never met in other high-rank weevil taxa, and never assembled within one: they are very good fliers, many can leap, and some are good swimmers (Korotyaev 2006; Friedman 2018). Most members of the

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tribe are strictly specialized herbivores, and they are noteworthy for consuming plants rarely used either by other specialized or non-specialized herbivores. For instance, the largest genus of the Ceutorhynchitae, *Ceutorhynchus* Germar, 1823 with over 300 described species, is associated almost exclusively with plants of the family Brassicaceae ignored by most generalists because of their chemical protection provided by secondary compounds including cyanogenic glycosides (Lukjanovich 1937). Other plants with toxic metabolites, which genus- and family-groups of Ceutorhynchitae are associated with, are Ephedraceae, Liliaceae (e.g. *Allium*), Zingiberaceae, several genera of Ranunculaceae, Papaveraceae (*Papaver* spp.), Solanaceae, Cannabaceae, Rutaceae, Rubiaceae, Onagraceae, including also some thorny or latex-rich Asteraceae (*Taraxacum* spp.), stinging Urticaceae, etc. (Colonnelli 2004). A prominent ecological feature of the Ceutorhynchitae is their obvious preference for the ruderal and weedy coenophobic plants (Razumovskii 1981) and pioneers of the newly formed habitats (Korotyaev 1992, 2006), which makes them good agents for biological control of weeds. Hinz *et al*. (2018) list nine species of Ceutorhynchitae out of 26 weevil species used or being investigated as potential biocontrol agents. In the Palaearctic Region, the Ceutorhynchitae comprise ten tribes, the largest being Ceutorhynchini (Colonnelli 2004; Alonso-Zarazaga *et al*. 2017). The fauna of Ceutorhynchitae of Israel is still largely unpublished, with around 50 recorded species (Colonnelli 2004; Alonso-Zarazaga *et al*. 2017) and several dozens of formally unrecorded or undescribed species (unpubl. data, based on the SMNHTAU collection).

Thamiocolus is the third largest genus of the Ceutorhynchini (Korotyaev 2008), with 46 species described by 2017 (Alonso-Zarazaga *et al*. 2017), one being synonymized below. All known hosts of the *Thamiocolus* species are labiates (Lamiaceae). The genus *Phlomis* L. harbours apparently the greatest number of species in the Mediterranean; at least ten species are associated with the plant in Turkey. Korotyaev *et al*. (2016) mentioned eight species associated with *Phlomis*, although only five were actually listed (Korotyaev *et al*. 2016: 39). Colonnelli (2004) reported also *Th. comptus* Colonnelli, 1997 from *Phlomis*. Korotyaev and Gültekin (2020) recorded *Th. susannae* Dieckmann, 1982, *Th. dieckmanni* Korotyaev & Gültekin, 2020, and *Th. hamzai* Korotyaev & Gültekin, 2020 from *Phlomis* spp. Finally, *Th. anthracinus* Colonnelli, 2005 (Figs 16, 17, 22, 23) should be added to this list based on the collection by Korotyaev and Gültekin in Turkey. The question mark for *Th. susannae* in their paper (Korotyaev & Gültekin 2020) may be deleted after receiving by the first author a photograph of the *Th. susannae* holotype, kindly made by Mrs. Mandy Schröter, Technical Assistant at the Coleoptera Department of the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany in November, 2020, for which he thanks her once again.

Two species of *Thamiocolus* were previously recorded from Israel, namely *Th. wittmeri* Colonnelli, 1975 and *Th. volkovitshi* Korotyaev, 1997 (Alonso-Zarazaga *et al*. 2017). Investigation of the weevil fauna by the second author has provided extensive material and host plant associations for *Th. volkovitshi.* In addition, an

undescribed species was found in three localities along the transition belt between the Mediterranean scrubland and the desert, and a number of specimens of *Th. pici* Korotyaev, 1997 described from a single male in the Muséum national d'Histoire naturelle, Paris, collected by the famous French entomologist Maurice Pic (1866–1957) on one of his trips to the Middle East and supplied only with a handwritten label "*Ceutorhynchus* no. 537" (Figs 12–15). To summarize data on the Israeli *Thamiocolus*, we describe herein the new species and give a key to the four species known from the country, also including a single female from Latakia (Syria) that is very similar to the western Turkish *Th. comptus* Colonnelli, 1997.

MATERIALS AND METHODS

The studied material is deposited in the Steinhardt Museum of Natural History, Tel Aviv University, Tel Aviv, Israel (SMNHTAU), Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZIN) and in the private collection of Enzo Colonnelli, Rome, Italy (COL). A specimen of *Th. wittmeri* from the collection of the Senckenberg Deutsches Entomologisches Institut, Müncheberg (formerly Deutsches Entomologisches Institut; SDEI) and a syntype of *Th. tataricus* in the Naturhistorisches Museum Basel, Switzerland (NHMB) were examined; photographs of the *Th. calcaratus* holotype in the latter museum were kindly made and provided by Dr Ch. Germann (NHMB).

Images on Figs 1, 4–10, 19, 21, 26, 28, 29 were taken by Genrik E. Davidian (All-Russian Institute of Plant Protection, St. Petersburg–Pushkin, Russia), Figs 3, 11, 16, 17, 20, 22, 23 by Kirill V. Makarov (Moscow State Pedagogical University, Russia), and Figs 18, 24, 25 by Christoph Germann (Naturhistorisches Museum, Basel, Switzerland). Images on Figs 2 and 27 were taken by the second author with a Leica DFC295 digital camera mounted on a Leica M205C microscope; image stacks were processed with Leica Application Suite 4.2.0 and Helicon Focus 5.3. Final image editing was done in Adobe Photoshop CS5. Photographs of habitats and plants in Israel were taken by the second author.

Drawings and measurements were made by the second author using a drawing tube and a Leica M125 stereomicroscope. Drawings were scanned and processed with Adobe Illustrator 9.0. Total body length was measured along a straight line extending from the base of the rostrum to the line connecting apices of the elytra in the dorsal view.

Genitalia were extracted after soaking dry specimens in warm water, detaching the posterior sternites of the abdomen and boiling them in 10 % KOH. The extracted genitalia are either glued on cards with the specimens or placed in a microvial with glycerol pinned under the specimen.

Transliterated names of localities in Israel follow the *Israel Touring Map* (Survey of Israel 2009). Where names of localities have changed, the most recent transliterated Hebrew names are given followed by the alternative, old or erroneously cited names in brackets, e.g. 'En Hemed [Aqua Bella].

TAXONOMY

Genus *Thamiocolus* C.G. Thomson, 1859

A key to species of the genus *Thamiocolus* from Israel and adjacent countries

1 (4) Dorsal surface with distinct, moderately to sharply contrasting pattern formed by wide oval scales on background of narrower golden or brown to black scales (Figs 1, 2). Pronotum with somewhat angularly rounded sides, lateral tubercles weak but distinct. Elytral striae with well visible light scales. Femora with well-developed sharp tooth. Body smaller, 2.50–2.95 mm 2

2 (3) Elytra with pale pattern composed of two transverse white bands on background of golden narrower scales (Fig. 1). White oval scales on elytra flat or only slightly depressed medially. Venter without contrasting black spots. Preapical prominences of elytra rounded. 2.50–2.85 mm .... *chikatunovi* n. sp.

3 (2) Largest part of elytra densely covered with wide white scales, only anterolateral corners and preapical band lateral of 3rd interval with dark brown or black scales (Fig. 2). White oval scales on elytra deeply depressed medially. Venter with contrasting black spots in middle of 3rd and 4th ventrites and at sides of anal ventrite. Preapical prominences of elytra angular. 2.80–2.95 mm .... *wittmeri*

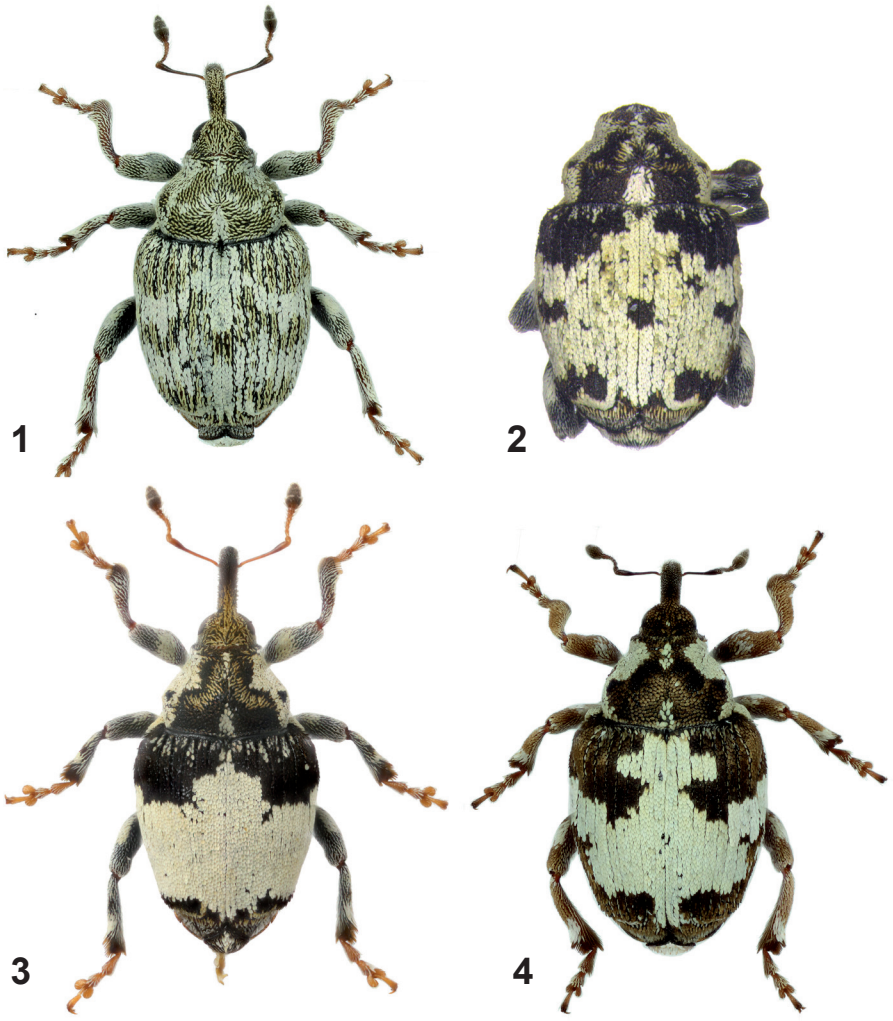
4 (1) Dorsal surface with uniform varyingly dense vestiture of narrow lanceolate or parallel-sided to almost hair-like recumbent greyish or brown scales. Pronotum with sides regularly rounded, lacking any trace of lateral tubercles. Elytral striae bare. Femora mutic or with vestigial tooth (somewhat irregularly convex in thickest part). Body larger, 2.65–3.85 mm 5

5 (8) Dorsal vestiture rather dense, composed of recumbent narrow greyish scales producing grey appearance of the beetles. Punctation of pronotum fine and very dense, pronotal surface scarcely shining or almost matt. Entire underside densely covered with wide oval or lanceolate scales, narrower scales present only on medial part of metasternum and at sides of anal ventrite. Wide scales on underside may have margins finely plumose. Scales on elytral intervals arranged in 3 irregular rows and almost concealing their surface. Intervals of elytra usually not more than twice as wide as striae, latter rather deep and wide. Larger, 3.30–3.85 mm..... 6

6 (7) Apical part of rostrum of female more strongly and narrowly attenuate (Figs 9, 21), with dense short erect setae on sides; basal part with scales semi-erect, producing rough appearance. Legs longer, hind femur 3.3–3.4× as long as wide. Antennal funicle and tarsi (including ventral surface of claw-segment) hirsute, with longer and denser almost erect setae. Antennal club blunted apically, with margins between segments step-like. Tarsi shorter and narrower, 3rd segment of fore tarsus in female shorter than, and 1.4× as wide as 2nd segment. Wide scales on underside with margins finely plumose. (Bottom of depression

on male anal ventrite covered with plumose scales not more densely than lateral areas of ventrite. Vestiture on raised sides of depression on male anal ventrite not conspicuously denser and longer than on rest surface. Aedeagus with symmetrical apex (Fig. 7)). 3.40–3.85 mm. On *Phlomis viscosa* Poir. ..... *volkovitshi*

7 (6) Apical part of rostrum less strongly and narrowly attenuate (Figs 8, 19), lacking erect setae on sides; vestiture on sides in basal part recumbent. Legs



Figs 1–4: *Thamiocolus* spp., habitus, dorsal view: (1) *Th. chikatunovi* n. sp., male holotype, Israel; (2) *Th. wittmeri*, male, Israel; (3) *Th. niveus*, female, North Africa; (4) *Th. kerzhneri*, female, Tuva. (Figs 1, 4 by G.E. Davidian, Fig. 2 by A.-L.-L. Friedman, Fig. 3 by K.V. Makarov)

very short, hind femur 2.8× as long as wide. Antennal funicle and tarsi not hirsute (ventral surface of claw-segment bare), with usual moderately long light, semi-erect setae. Antennal club moderately narrowing and not blunted apically, with margins between segments not step-like. Tarsi longer and wider, 3rd segment of fore tarsus in female as long and 1.7× as wide as 2nd segment. Wide scales on underside with margins entire or only at apices inconspicuously plumose. 3.3 mm. [Syria: Latakia] ..... ? *comptus*

8 (5) Dorsal vestiture sparse, composed of almost hair-like grey or brown scales arranged on intervals in 2 confused rows and not conspicuously covering their surface; beetles looking black. Punctation of pronotum shallow but punctures rather large, intervals between them often lustrous. Intervals of elytra more than twice as wide as striae, latter narrow and rather shallow. Underside rather sparsely covered with narrow scales, wide oval scales present only along dorsal margins of meso- and metathorax. Antennal funicle and tarsi not conspicuously hirsute, with shorter and sparser semi-erect setae. Bottom of depression on male anal ventrite densely covered with wide lanceolate scales much wider than those on sides of the ventrite. Strongly raised sides of the depression very densely covered with erect yellow hairs. Aedeagus with slightly asymmetrical apex (Fig. 6). Smaller, 2.65–3.20 mm ..... *pici*

Thamiocolus chikatunovi n. sp.

(Figs 1, 5, 30–35)

LSID: urn:lsid:zoobank.org:act:134E8D13-53BD-4288-AECA-871068659051.

Etymology: The species is named in honour of Prof. V. I. Chikatunov on the occasion of his 80th birthday, paying tribute to his valuable contribution to the studies of the Coleopteran fauna of Israel.

Description: Male. Rostrum 1.15–1.17× as long as pronotum, 0.6–0.7× as wide as fore femur, weakly bent, somewhat more strongly so at antennal insertion, parallel-sided along most of its length, weakly narrowing at base and more strongly so toward apex distal to antennal insertion, scarcely compressed laterally with sides almost flat. Dorsal surface moderately convex in cross-section, matt, densely rugosely punctate, except for very short apical portion, without carinae, noticeably declivous in apical part. Antennae inserted at 0.29–0.32 distance from apex of rostrum. Scape rather stout, moderately swollen in apical part. Funicle short; 1st segment twice as long as wide, 2nd segment about as long as, or slightly longer than 1st, and half as wide; 3rd and 4th segments subequal in length, ⅔ as long as 2nd segment and about twice as long as wide; 5th segment less than 1.5× as long as wide, scarcely wider than 4th; 6th segment about as long as wide, 7th moderately transverse, both noticeably wider than 5th segment. Pubescence of funicle fine, moderately long, semi-erect. Club short, ovate, with scarcely blunted apex and distinct although not deep sutures between

segments. Eyes small, rather weakly convex, irregular-shaped, with rather widely rounded posterior margin. Frons flat, posterior part of frons and temples slightly depressed along margins of eyes.

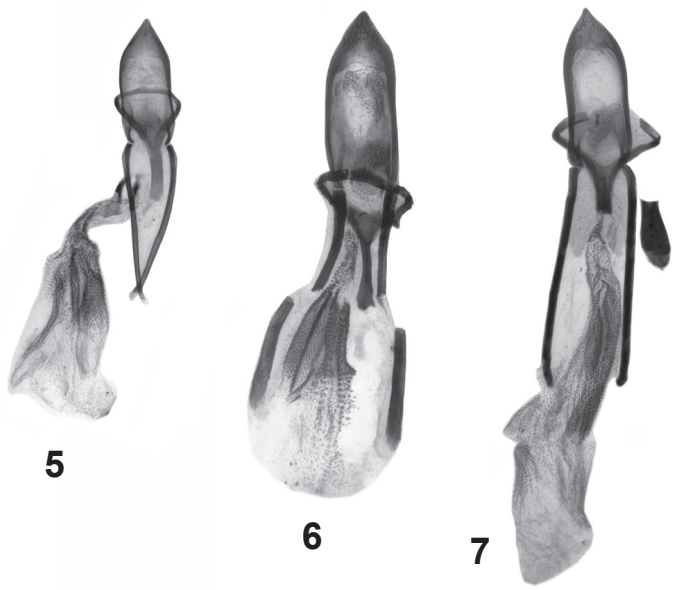
Pronotum 1.40–1.44× as wide as long, with base very widely angular, moderately long apical part separated by constriction not raised, tubular, very shallowly emarginate in medial half or obsoletely emarginate along entire anterior margin. Sides almost angularly protruding somewhat behind mid-length, strongly convexly converging toward base and more strongly and almost rectilinearly converging toward apex. Lateral tubercles weakly prominent but quite distinct, formed by coarser, almost granular intervals between punctures. Disc moderately and almost regularly convex, deepest slightly behind mid-length, shallowly depressed at sides in anterior half; matt, with dense, regular, small punctures. Median sulcus reduced to a shallow prescutellar fovea in basal quarter of pronotum.

Scutellum narrow, keel-shaped, matt. Apices of mesepimera moderately convex, clearly visible from above.

Elytra 1.03–1.08× as long as wide, very weakly narrowing from shoulders toward mid-length and more strongly narrowing then toward apex; sides scarcely concave in basal part and almost rectilinear or barely concave in apical part, rather smoothly rounded; preapical prominences obtuse-angularly rounded, well defined. Disc moderately convex, deepest slightly behind mid-length, shallowly depressed along suture between 3rd intervals in basal third of elytra and slightly depressed at sides somewhat behind humeral prominences. Striae rather narrow and moderately deep, their sides slightly notched by dense oblong, somewhat irregular punctures. Intervals flat, about twice as wide as striae, weakly shining, with dense rather large punctures. Fine granules in apical part of lateral intervals not condensed to form an angulation of elytral contour.

Femora wide, all with sharp tooth largest on middle femur. Middle and hind tibiae with equal-sized, moderately long, acute mucro pointed posteromedially. On fore tibia, corbel occupying nearly ⅓ of its outer margin and ending in weak prominence, moderately emarginate, with dense, narrowly separated, narrow-triangular mid-brown spines. Corbel of hind tibia deeply emarginate, ending in a prominence with condensed spines, and occupying slightly less than ⅓ length of outer margin. Tarsi narrow, 1st and 2nd segments slightly compressed, 1st segment twice, 2nd 1.5× as long as wide, 3rd segment 1.6× as wide and 0.83× as long as 2nd; claw-segment by slightly more than ⅔ extending beyond lobes of 3rd segment, moderately and evenly widening from base toward apex. Claws moderately long, with subconnate appendages medially not reaching their apices.

Pygidium with dorsal margin deeply bisinuate and narrowly produced medially, moderately transverse, roundly narrowing toward ventral margin, latter long, almost rectilinear. Surface slightly and almost evenly convex in cross-section or scarcely depressed dorsomedially, matt. Anal ventrite with deep transverse-oval depression



Figs 5–7: *Thamiocolus* spp., aedeagi, dorsal view: (5) *Th. chikatunovi* n. sp., paratype; (6) *Th. pici*; (7) *Th. volkovitshi*. (Photo by G.E. Davidian)

in medial third; sides of depression only weakly obtusely convex and lacking erect setae; bottom of depression with pubescence as dense as elsewhere on the ventrite. Posterior part of ventrite lateral of depression weakly bent dorsally.

Aedeagus as in Fig. 5.

Female. Rostrum 1.18× as long as prothorax, weakly or very weakly regularly bent in basal 0.7, weakly bent at apical 0.3 and almost straight hereafter, moderately narrowed toward half-way off antennal insertions and then subcylindrical, with glabrous apical part longer than in male, about as long as wide; sides of rostrum in apical part with fairly dense semi-erect fine brownish hairs. Antennae inserted at 0.36 rostrum length from apex. Prothorax 1.33× as wide as long. Elytra 1.1× as long as wide.

Body black; funicle and extremities of scape of antennae, tibiae and tarsi light to mid-brown; apex of rostrum and antennal club black even in the teneral individual (with brown legs). Basal part of rostrum and head capsule densely clothed with moderately raised, narrow, posteriorly-pointed, light golden scales not concealing integument completely; brown scales may be scattered in between along sides of rostrum. Apical part of rostrum black, with sparse light hair-like scales over antennal insertions and with dark hairs distally; those on sides semi-erect, rather long and well visible. Disc of pronotum evenly covered with wider recumbent, truncate apically golden scales separated mostly by less than own widths. In addition, larger oval white scales constitute median line broken in apical half and densely cover sides leaving

free apices of lateral tubercles. Elytra with slightly wider golden scales arranged mostly in 2 or 3 rows on intervals and replaced by darker brown scales in short area behind middle on sutural interval and in short ill-defined speckles in basal half of 3rd, 5th and 7th intervals. Large oval white scales covering entire sutural interval except for short dark area behind mid-length, constituting angular basal band running from end of basal quarter of sutural interval toward sides behind humeral prominences, and wider, less clearly defined preapical band. Striae with very narrow lanceolate subrecumbent white scales. Underside almost evenly covered with broadly oval white scales thinned at sides. Pygidium densely covered with semi-erect broad oval and lanceolate (pointed apically) white scales, with sparse semi-erect hair-like scales or hairs in lateral corners and along posterior margin. Femora moderately densely clothed with subparallel-sided yellowish scales shorter than those on elytral intervals and separated mostly by own widths, with rings of larger wide oval and lanceolate white scales distal to mid-length; that on hind femur extending ventrally toward apex of femur, base of femur also with wide white scales. Tibiae with similar yellowish scales replaced along dorsal surface with white scales becoming wider toward apical combs. Dorsal surface of tarsi moderately densely clothed with white hair-like and wider subrecumbent and semi-erect scales, 2nd and 3rd segments with longer and wider scales at apices protruding over subsequent segments.

Body length 2.50–2.85 mm.

Comparison: The new species is similar to *Th. wittmeri* in the shape and proportions of the body, rostrum, and antennae, also in the structure of the legs, but differs in the much less extensive white pattern of the dorsal surface, light coloration of the darker scales on the elytra, and in the absence of the contrasting black spots on the venter. White broad scales of the elytral pattern are not or only slightly depressed medially. The dorsal outline of the elytra is smoother, preapical prominences are much more widely rounded and lacking conspicuous angulation.

Holotype: ♂ [288552] **Israel:** 'Har Qida [32°03'N 35°21'E], SE, Gid'on Road, 685 m, 13.iv.2018, L. Friedman' (SMNHTAU).

Paratypes: Israel: Ma'on, 0–1 km S, 750–800 m, 14.iv.2015, L. Friedman, 1♂ (SMNHTAU), A. Freidberg, 1♀ (ZIN); 1♀ [288547] Kokhav haShahar – Rimonim, Alon Rd. 485, Wadi Wahita, opposite cliff, 570 m, 13.iv.2018, L. Friedman (SMNHTAU). **Jordan:** 1♀ (pattern quite abraded on left side): "Jordania – m 750 / Mt. Nebo nr. Madaba / 25.iii.1987 – P. Audisio" [white, handwritten] (COL).

Distribution: In Israel, four specimens were found along the transition belt between the Mediterranean scrubland and the desert, the western edge of the Samarian and Judean deserts. This area is situated at the altitudes of 500–800 m asl and is characterized by high temperatures, low humidity with 250–300 mm annual precipitation, and low vegetation of the Mediterranean, Irano-Turanian and Saharo-Sindian origin, with high percentage of the local endemics (Shmida 2005; Zohary 1973; Amos Sabah, pers. comm.). In Jordan, the single specimen was collected on Mount Nebo, the Abarim Ridge (700–800 m), an area with the biotic and abiotic characteristics rather similar to those described for the Israeli part of the species range.

Biology: All specimens were swept occasionally in the habitats with different vegetation, and their association with any plant was not noticed. As most of the *Thamiocolus* species are associated with *Phlomis* spp., *Phlomis brachyodon* (Boiss.) Zohary may be a host. The second author visited repeatedly the type locality, Gid'on Road, east to Shilo (Fig. 30), and the part of the Alon Road between Kokhav haShahar and Rimonim (Fig. 35), where one paratype was collected, but *Ph. brachyodon* was not found, although this plant is widely distributed in the area, particularly on Har Kokhav (Figs 33, 34). Instead, *Marrubium vulgare* L. (Fig. 31) and *Ballota undulata* (Sieber ex Fresen.) Benth. (Fig. 32) were very common throughout the type locality. The latter plant may well be a host of the new species, as *Th. niveus* is associated with *Ballota nigra* L. (Colonnelli 2004).

All four known specimens had been collected on 13–14 April in 2015 and 2018, but intensive searches in the same area nearly at the same date in 2019 and 2020 were unsuccessful. The period, when the adults can be found on the plants, is probably very short lasting 2–3 days only.

Thamiocolus ? *comptus* Colonnelli, 1997

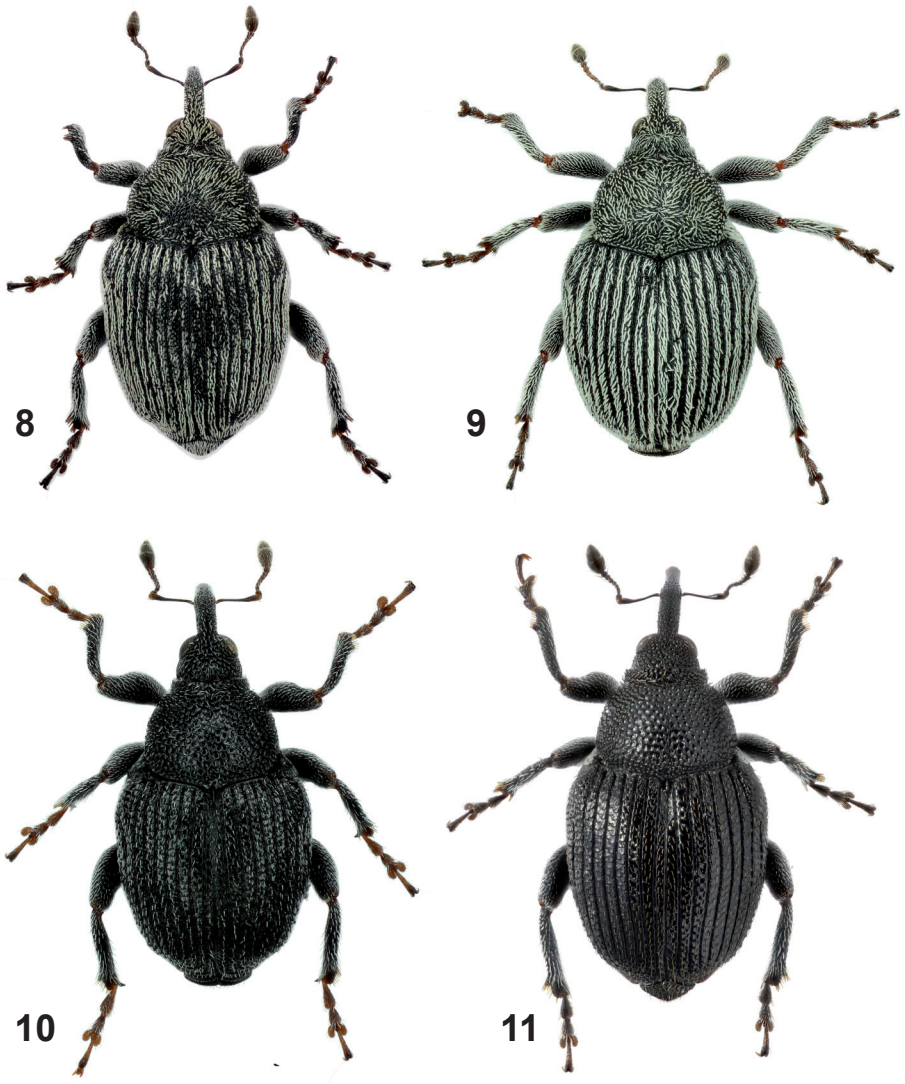
(Figs 8, 19)

Description: Female. Rostrum as long as pronotum, rather smoothly moderately bent in basal part and almost straight somewhat distal to antennal insertions; subcylindrical, in lateral view noticeably and almost evenly tapering from base toward antennal insertions and more strongly tapering toward apex distal to latter. In dorsal view, rostrum at base 1.45× as wide as at apex and 0.61× as wide as fore femur, scarcely narrowing toward antennal insertion, then much more strongly narrowing toward apex, with sides slightly concave. Dorsal surface moderately and evenly convex in cross-section, almost matt, very densely and finely punctate, lacking any longitudinal carinae. Distal part of rostrum linearly raised along midline half-way to apex, then more shining, with punctures thinned. Antennae inserted at 0.44 rostrum length from apex. Scape with apical third moderately swollen and bent. Funicle short; 1st segment twice as long as wide, 2nd segment slightly shorter than, and half as wide as 1st, 3rd segment almost twice as long as wide, 4th slightly shorter, 5th segment slightly longer than wide, 6th segment weakly, 7th moderately transverse, both noticeably wider than 5th segment. Pubescence of funicle fine, moderately long, semi-erect, moderately raised. Club ovate, not blunted apically, compact, with margins between segments not step-like. Eyes medium-sized, rounded triangular, moderately convex. Frons flat; frons and vertex matt, densely punctate.

Pronotum 1.30× as wide as long, rather strongly rounded at sides, broadest in very beginning of middle third; base moderately obtuse angularly projecting posteriorly in middle; apical constriction separating very short ring ('collar'), latter weakly raised and ending in glabrous margination, moderately emarginate medially (at about 1.5× width of rostrum at base). Disc moderately convex, more strongly so in basal half;

almost matt, with dense, regular, rather fine punctures. No trace of median sulcus or lateral tubercles present; prescutellar fovea small, narrow, deepening posteriorly.

Scutellum narrow, keel-shaped. Apices of mesepimera weakly convex, clearly visible from above.



Figs 8–11: *Thamiocolus* spp., habitus, dorsal view: (8) *Th*. ? *comptus*, female, Syria; (9) *Th. volkovitshi*, male; (10) *Th. pici*, male, Israel; (11) *Th. pici*, female, Israel. (Figs 8–10 by G.E. Davidian, Fig. 11 by K.V. Makarov)

Elytra 1.13× as long as wide, with moderately prominent widely rounded shoulders, widest immediately behind them (where 8th stria becomes visible dorsally), with sides weakly and slightly concavely converging toward slightly behind mid-length, then more strongly rectilinearly converging toward well-defined, obtuse-angular preapical prominences. Disc moderately and almost evenly convex except for short shallow depression along suture immediately behind scutellum and faint oblique depressions posteromedially to humeri. Striae rather narrow and moderately deep, their sides slightly notched by rounded punctures separated by about own diameters. Intervals flat, about twice (or, in some places, slightly more) as wide as striae, weakly shining, with moderately dense medium-sized, shallow punctures.

Legs short. Femora wide, strongly roundly widened behind mid-length, hind femur widest, 2.8× as long as wide. Middle and hind femora with faint angulation in widest place lacking bunch of raised white scales; area posteroventral to angulation noticeably depressed, with a few white scales. Fore tibia moderately outcurved apically, corbel occupies nearly ⅓ of its outer margin and ending with a weak prominence, rather shallowly emarginate, bearing 7 moderately long wide spines separated in middle part of corbel by own widths. Corbel of hind tibia more deeply emarginate, ending with large prominence, and occupying slightly less than ⅓ of outer margin of tibia. Tarsi narrow and short; 1st segment of fore tarsus almost twice, 2nd 1.3× as long as wide, 3rd segment as long and 1.7× as wide as 2nd, its lobes rounded at outer side; claw-segment by 0.75 of own length extending over lobes of 3rd segment, moderately widening from base toward apex. Claws long and rather narrow, with long separated, weakly incurved apically appendages nearly reaching their apices. Tarsi dorsally lacking fine erect setae in addition to sparse semi-erect, moderately long, white setiform scales.

Anal ventrite in medial third flat, with apical margin weakly narrowly attenuate medially. Pygidium weakly transverse (1.3× as wide as long), with apical half gently bent dorsally, narrowly rounded apically, densely and rather coarsely rugosely punctate, matt.

Body black; apex of antennal scape, funicle, very base of tibiae, and tarsi dark brown. Basal part of rostrum and head capsule densely clothed with recumbent narrow, sublinear, grey scales; apical part almost bare, with sparse short inconspicuous recumbent setae, with no erect hairs on sides. Pronotum evenly covered with recumbent narrow grey scales spaced by usually more than their width, prescutellar fovea with a few short wider white scales at very base. Sides of prothorax with broad-lanceolate (in anterior part) and oval (in posterior part) white scales. Intervals of elytra mostly with 2–4 (mostly 3) rows of narrow (ca. 4× as long as wide) scales with truncate apex. Striae bare. Sides of meso-, metathorax and 1st–4th abdominal ventrites with dense broad-oval white scales, medial part of thorax and basal two ventrites with sparser narrow scales. Femora and tibiae uniformly, moderately densely clothed with narrow parallel-sided grey scales. Anal ventrite in medial third with a spot of broad-lanceolate white scales narrowing apically, sides of ventrite

with very narrow acuminate scales. Pygidium with long semi-erect, very narrow acuminate white scales and hairs.

Body length 3.3, width 1.9 mm.

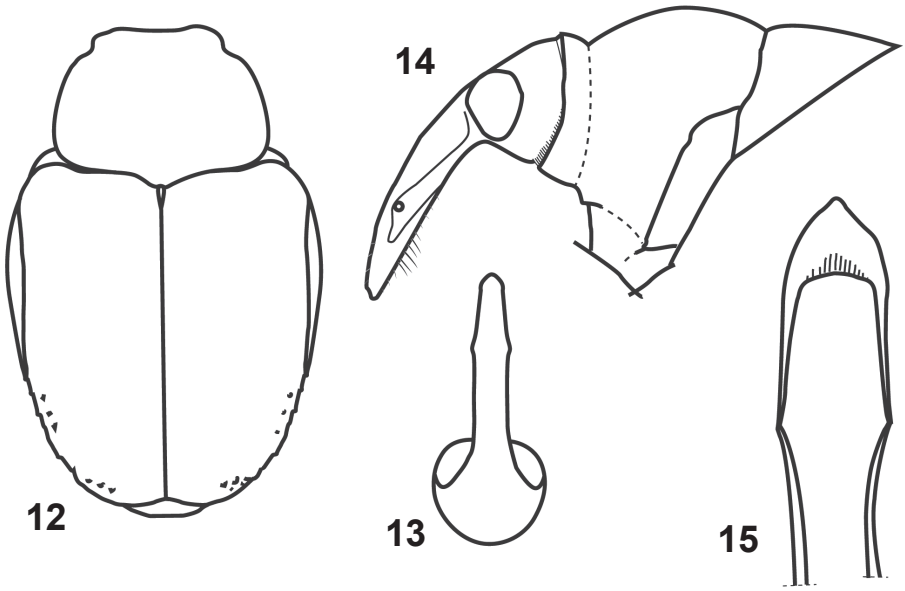
Material examined: Syria: 1♀ "Latakia, 30 km O: Saladin Burg, 410 m, 02.V.2002, Herbert Schmid, *Thamiocolus* sp. cf. *comptus* Colonn., Behne det. 2003" (ZIN, donated by the late W. Suppantschitsch, Vienna).

Remarks: The only female is very similar to *Th. comptus* Colonnelli from southern Turkey but differs in the gently curved, gradually and more strongly narrowing apically rostrum not flattened dorsally, longer antennal funicle (3rd segment in *Th. comptus* is as long as wide, 4th and 5th not longer than wide), more angular preapical prominences of the elytra, and less outcurved apically fore tibia with a less rounded inner margin.

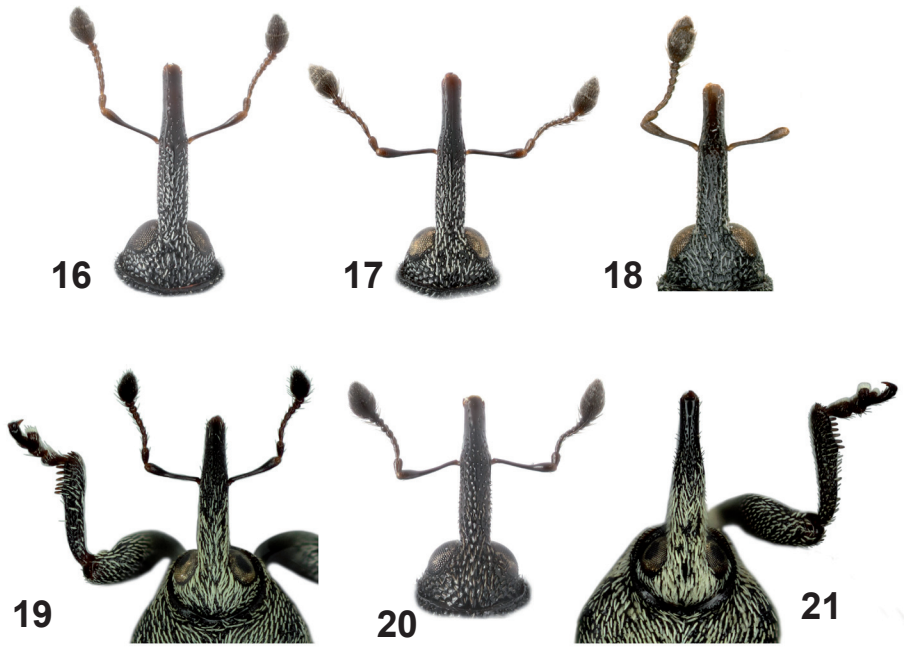
Thamiocolus pici Korotyaev, 1997, sp. propria

(Figs 6, 10, 12–15, 20, 29, 36–40, 43–45)

Thamiocolus pici was synonymized with *Th. calcaratus* (Schultze, 1901) by Colonnelli (2004) without any comment. Description of *Th. calcaratus* was based on a single female from Konya Province (Schultze 1901) in Turkey. Dr Ch. Germann (NHMB) kindly made photographs of the holotype of *Th. calcaratus* published herein with his permission (Figs 18, 24, 25); they depict a female very similar



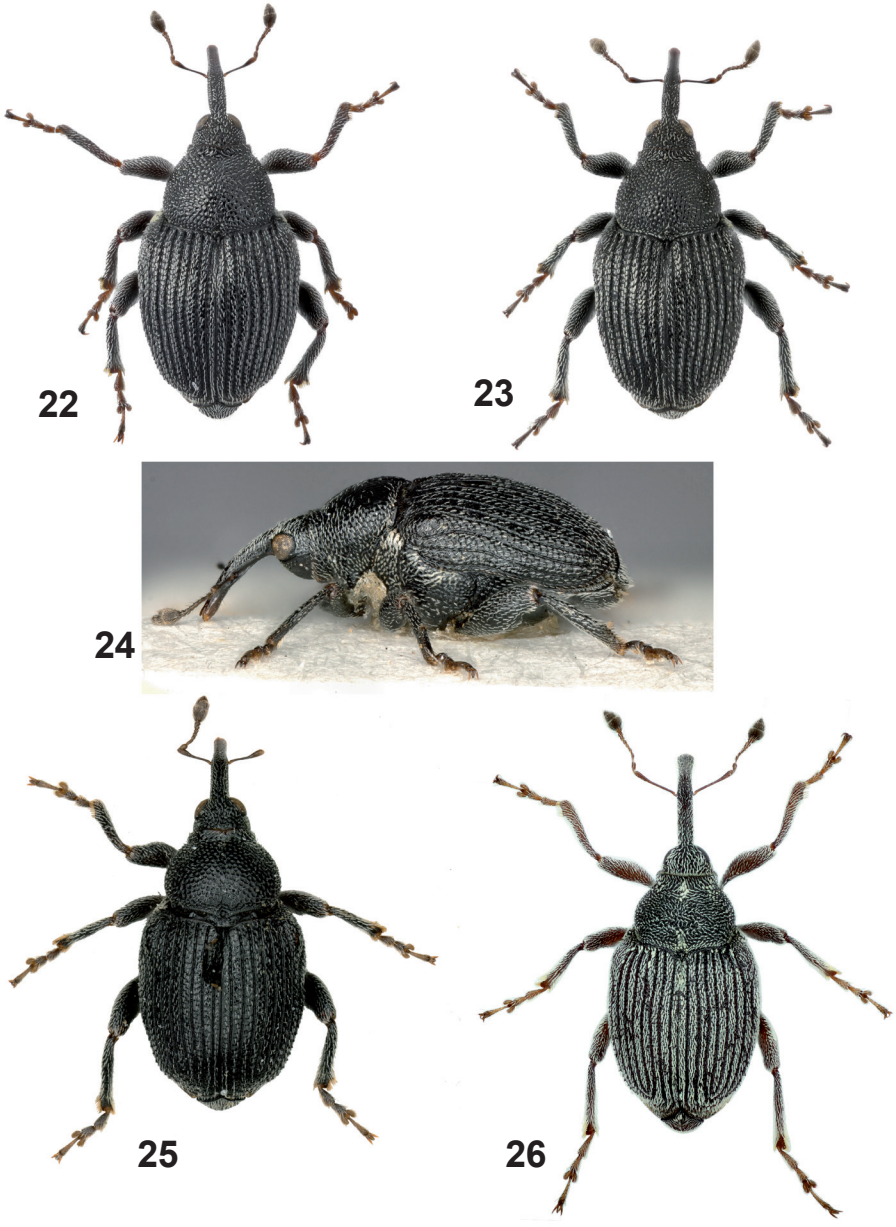
Figs 12–15: *Thamiocolus pici*, male, holotype: (12) body outline; (13) rostrum, dorsal view; (14) head and pronotum, lateral view; (15) aedeagus, dorsal view. (Modified after Korotyaev (1997))



Figs 16–21: *Thamiocolus* spp., head, dorsal view: (16) *Th. anthracinus*, female, Turkey, Malatya Prov.; (17) *Th. anthracinus*, female, Turkey, Bingöl Prov.; (18) *Th. calcaratus*, holotype; (19) *Th.* ? *comptus*, female, Syria; (20) *Th. pici*, female, Israel; (21) *Th. volkovitsi*, female, Israel. (Figs 16, 17, 20 by K.V. Makarov, Fig. 18 by Ch. Germann, Figs 19, 21 by G.E. Davidian)

indeed to the females from Israel (Figs 11, 20) except that it has scales on the elytral intervals slightly coarser than in *Th. pici* and white (which may be present also in *Th. pici*) and the elytral striae are slightly wider. Yet we have not seen any specimen from the central or western parts of Turkey definitely conspecific with the holotype. Dieckmann (1975) recorded *Th. calcaratus* from eastern part of Turkey (Bingöl), where probably *Th. anthracinus* Colonnelli, 2005 (Figs 16, 17, 22, 23) is actually distributed, as one of the paratypes of this species was collected even farther west in Malatya Province (Colonnelli 2005). Colonnelli (2005) records *Th. calcaratus* only from Konya and Isparta provinces; the photograph in his paper (Colonnelli 2005, fig. 33) depicts a small male with very sparse dorsal vestiture. In the *Palaearctic Catalogue* (Colonnelli 2013) he records *Th. calcaratus* also from Iran, but does not cite its record from Armenia (Korotyaev 1980). In addition, *Th. calcaratus* was recorded by the first author (Korotyaev 1997; misidentified as *Th. susannae* Dieckmann, 1982) from the Araks River valley in Armenia (confirming the former record of 1980), from Azerbaijan (Nakhchivan) and northern Iran.

It remains unclear if the Israeli material belongs to *Th. calcaratus* and the latter has then a disjunctive distribution being replaced by *Th. anthracinus* in eastern Anatolia, or the Israeli material represents a distinct species, apparently *Th. pici*. The holotype



Figs 22–26: *Thamiocolus* spp., female habitus: (22) *Th. anthracinus*, Turkey, Malatya Prov., dorsal view; (23) *Th. anthracinus*, Turkey, Bingöl Prov., dorsal view; (24) *Th. calcaratus*, holotype, lateral view; (25) *Th. calcaratus*, holotype, dorsal view; (26) *Th. tataricus*, Tajikistan, dorsal view. (Figs 22, 23 by K.V. Makarov, Figs 24, 25 by Ch. Germann, Fig. 26 by G.E. Davidian)

Figs 27–29: *Thamiocolus* spp., male abdomen, ventral view: (27) *Th. wittmeri*; (28) *Th. volkovitshi*; (29) *Th. pici*. (Fig. 27 by A.-L.-L. Friedman, Figs 28, 29 by G.E. Davidian)

of *Th. pici* was collected by M. Pic not in Turkey, but very likely in Israel or, maybe, in Lebanon where he collected *Th. volkovitshi* (Korotyaev 1997).

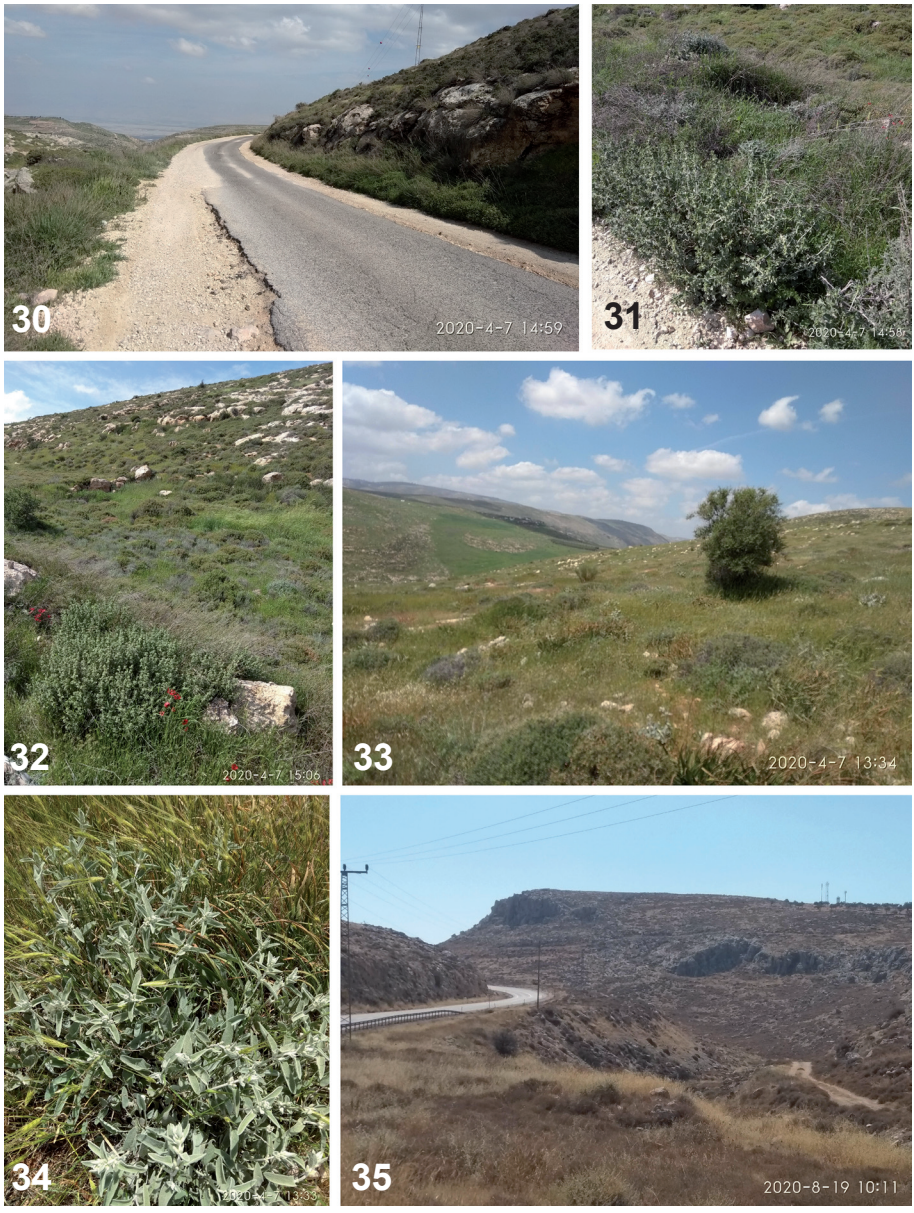
Material examined: Israel: *Hermon*: Har Hermon: 1♀ 2200 m, 25.vi.1997, V. Chikatunov (SMNHTAU); 1♀ 2000 m, 22.v.1973, D. Furth (SMNHTAU); 1♀ 7.vi.1993, V. Chikatunov (SMNHTAU); 2♂ 1700 m, 17.v.2009, A. Freidberg (SMNHTAU); 1♂ 1600 m, 20.vi.1993, V. Chikatunov (SMNHTAU); Har Hermon, Bol'an Valley, 2000 m, 18.vi.2020, L. Friedman, on *Phlomis brevilabris*, 3♀ (SMNHTAU), 1♂ 2♀ (ZIN). *Samarian Desert*: 1♀ Umm Zuqa Nature Reserve, Rt. 5788, 200 m, 18.iii.2008, L. Friedman (SMNHTAU).

Distribution: Israel: at high altitudes on Har Hermon. One specimen was collected by the second author in the Samarian Desert (see below).

Biology: A series of six specimens was collected by the second author on *Phlomis brevilabris* Boiss., a presumed host plant, in mid-June on Har Hermon, at the altitude of 2000 m asl. *Phlomis brevilabris* is distributed in Israel exclusively at high altitudes, in the tragacanth batha of Har Hermon (Figs 43–45) (Shmida 2005; Danin & Fragman-Sapir 2020). Therefore, it was most amazing to find one specimen of the weevil also in Umm Zuqa Nature Reserve, on the eastern slopes of the Samarian Desert at 200 m asl. (Figs 46, 47). Although the differences in the altitude and climate between the localities are striking, the type of the vegetation is somewhat similar (low Mediterranean scrubland mixed with Irano-Turanian and Saharo-Sindian floristic elements). *Phlomis brachyodon* (Boiss.) Zohary (Figs 34, 48)—distributed along the transitional belt between the Mediterranean area and the desert, in Jordan Valley, Samarian Desert, Judean Foothills, Judean Hills, and Northern Negev (Shmida 2005; Danin & Fragman-Sapir 2020)—is a possible host plant in this area. The specimens collected in June 2020 at 2000 m asl were taken from plants before blooming, while the same plant was in full bloom at 1600–1700 m, but no weevils were found. This corresponds to the observations on *Th. volkovitshi* (see below).

Thamiocolus volkovitshi Korotyaev, 1997
(Figs 7, 9, 21, 29, 41, 42)

Material examined: Israel: *Hermon*: Har Hermon: 1♂ 1800 m, 23.v.1998, A. Freidberg (SMNHTAU); 1♂ 1800 m, 25.v.1998, V. Chikatunov (SMNHTAU); 1♂ 1600 m, 14.v.1996, V. Chikatunov



Figs 30–35: Natural habitats and proved or presumed host plants of *Thamiocolus* spp.: (30–32) SE Har Qida, Gid'on Rd, 685 m, 7.iv.2020: (30) type locality of *Th. chikatunovi* n. sp., (31) *Marrubium vulgare* L., (32) *Ballota undulata* (Sieber ex Fresen.) Benth.; (33, 34) Har Kokhav, 7.iv.2020: (33) view to the East with clearly seen gradient of vegetation from the Mediterranean to eremic type, (34) *Phlomis brachyodon* (Boiss.) Zohary; (35) Alon Rd between Kokhav haShahar and Rimonim, Wadi Wahita, opposite cliff, 570 m, 19.viii.2020.

(SMNHTAU); 1♂ 20.v.1997, V. Chikatunov (SMNHTAU); 1♂ 23.v.1998, A. Freidberg (SMNHTAU); 2♂ 3♀ 1500 m, 22.v.1973, D. Furth (SMNHTAU). *Upper Galilee*: 2 exx., Goren, 33°03'N 35°13'E, 350 m, 8.iv.2014, E. Colonnelli, on *Phlomis viscosa* (COL); 1♂ 1♀ Nahal Keziv, 1.v.1999, 1♂ 7.v.1999, 1♂ 18.iii.2000, 1♂ 6.iv.2001, 1♂ 1♀ 20.iv.2001, 1♂ 1♀ 22.iv.2000, 1♀ 16.v.2000, all M. Finkel, netting (all SMNHTAU); 1♂ Montfort [Monfort], 33°02.635'N 35°13.271'E, 4.iii.2010, A. Freidberg (SMNHTAU); 1♂ Har Meron, Top Parking Lot – eastern lookout, 1120–1140 m, on *Phlomis viscosa*, 28.iv.2017, L. Friedman (SMNHTAU); 1♂ Har Meron, 1100 m, 22.v.1998, A. Freidberg (SMNHTAU); 2 exx., Har Meron, 1100 m, 32°59'N 35°24'E, 8.IV.2014, E. Colonnelli, on *Phlomis viscosa* (COL); 1♂ 26.v.1999, L. Friedman (SMNHTAU); 1♂ Har Meron, 1000 m, 29.iv.1974, D. Furth (SMNHTAU); 1♂ Har Meron, Nahal 'Ofaim, 1100 m, on *Phlomis viscosa*, 20.v.2013, L. Friedman (SMNHTAU); 7♂ 6♀ partly collected in copula, Har Meron, Horvat Hamama, 880 m, on *Phlomis viscosa*, 26.iv.2017, L. Friedman (SMNHTAU). *Carmel Ridge*: 2♂ 1♀ Nahal Oren, 6.iv.1998, V. Chikatunov, T. Pavlíček (SMNHTAU); 1♂ 15.vi.2002, A. Freidberg (SMNHTAU); 1♂ 15.iv.2002, T. Stern (SMNHTAU); 1♂ 16.iv.2003, A. Freidberg (SMNHTAU); 1♀ 15.iv.2005, A. Freidberg (SMNHTAU); 1♂ on *Phlomis viscosa*, 17.iv.2016, L. Friedman (SMNHTAU); 6 exx., Nahal Oren, near Oren junction, 2.iv.1995, E. Colonnelli, on *Phlomis viscosa* (COL); 17 exx., Nahal Oren, near Oren junction, 7.iv.1995, E. Colonnelli, on *Phlomis viscosa* (COL); 25 exx., Bet Oren, 220 m, 32°43'N 35°00'E, 6.iv.2014, E. Colonnelli (COL); 1 ex., Nahal Oren, near Har 'Arqan, 350 m, 6.iv.1995, E. Colonnelli, on *Phlomis viscosa* (COL). *Judean Hills*: 1♂ 'En Hemed [Aqua Bella], 24.iv.1961, J. Wahrman (SMNHTAU); 2♂ 1♀ Yerushalayim [Jerusalem], 20.iv.19??, H. Bytinski-Salz (SMNHTAU); 1♀ 18.iv.1957, J. Wahrman (SMNHTAU); 1♀ 'Emeq haEla, 20.iv.2005, D. Samsonovitz (SMNHTAU).

Distribution: Israel, Lebanon, Iraq (Korotyaev 1997).

Biology: Associated with *Phlomis viscosa* Poir. (Figs 41, 42), repeatedly collected and observed in copula on the plant. Copulation occurs slightly before the bloom.

Thamiocolus wittmeri Colonnelli, 1975

(Figs 2, 27)

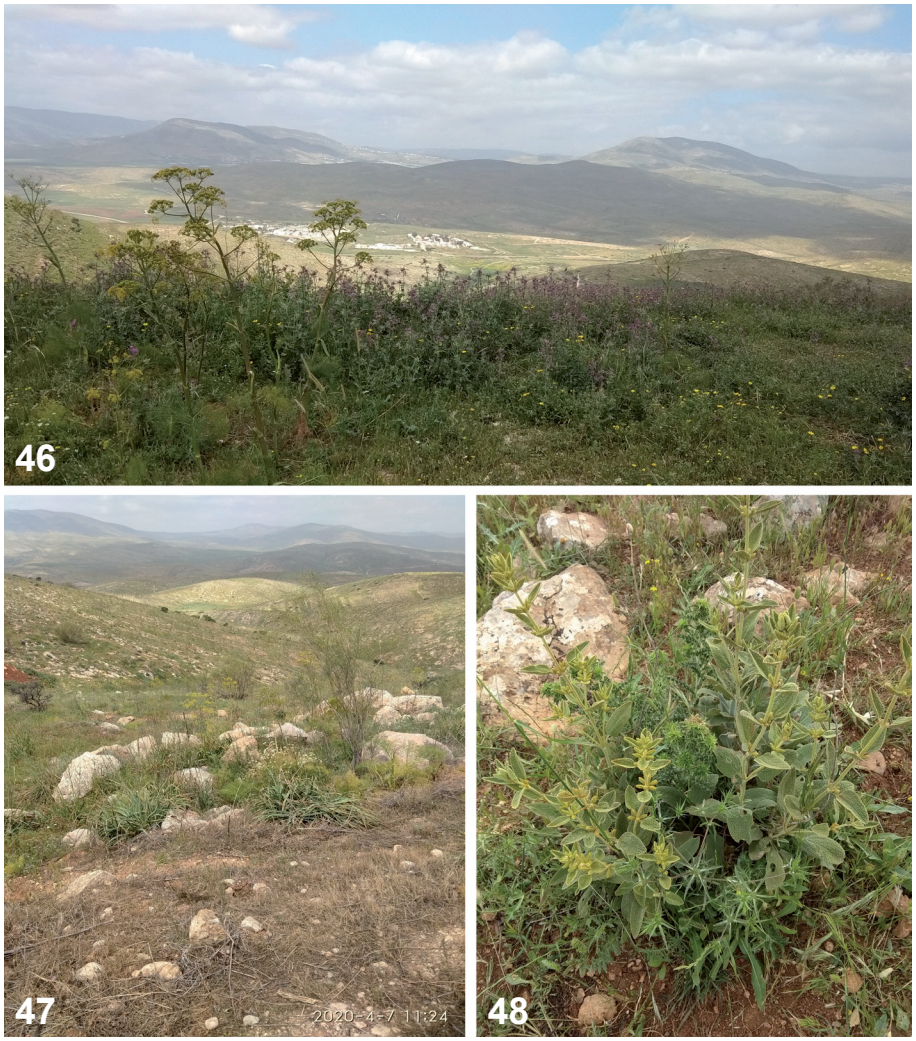
Material examined: Israel: *Har Hermon*: 1♂ Har Hermon, 800 m, 1.ii.1978, D. Furth (SMNHTAU). **Jordan:** 1♂ 'Ost-Jordanien, Schaubak, 17.v.1968, J. Klapperich, Dieckmann det. 1984' (SDEI, ex coll. L. Dieckmann).

Distribution: Israel (Colonnelli 2004), Jordan (new country record), Syria (Damascus: Colonnelli 1975). In Israel, the single specimen was found on Har Hermon, at 800 m asl (Figs 32–36, 39–41).

Biology: The western ally of this species, *Th. niveus* (Fig. 4), is associated with *Ballota nigra* subsp. *nigra* L. (Colonnelli 2004), present in neither Israel nor Syria. One of the potential hosts of *Th. wittmeri* is *Phlomis brachyodon* (Boiss.) Zohary (Figs 30, 44). The plant is distributed in Israel in the Jordan Valley, Samarian Desert, Judean Foothills, Judean Hills and Northern Negev, but is very rare in the Golan Heights, and is unrecorded on Har Hermon (Shmida 2005; Danin & Fragman-Sapir 2020). It occurs also in the Petra area in Jordan close to Shobak (Taifour & El-Oqiaq 2014), where *Th. wittmeri* has been collected, and in Syria. Other presumed hosts are *Phlomis chrysophylla* Boiss. and *Phlomis viscosa* Poir. These plants are common at lower altitudes on Har Hermon (Shmida 2005; Danin & Fragman-Sapir 2020); the second author was sweeping and beating them regularly and consistently through years, but found no additional specimens. The closely related *Th. kerzhneri* Korotyaev, 1980 (Fig. 5) was swept in numbers by the first author from the host plant, *Panzerina lanata* (L.) Soják, in southern Tuva on July 28 and 29, 1980 (Korotyaev

Figs 36–42: Natural habitats and proved or presumed host plants of *Thamiocolus* spp.: (36–40) Har Hermon: (36) summit, 2230 m, 17.v.2009, habitat of *Th. pici* and *Th. wittmeri*; (37–40) 17.vi.2020: (37) 1500 m, (38) *Phlomis chrysophylla* Boiss., (39, 40) 1700 m, Busheri Turn, with blooming *Phlomis brevilabris* Boiss. (40); (41, 42) Qedumim, Shomeron, 1.v.2020: (41) typical landscape of Mediterranean batha, with blooming *Phlomis viscosa* Poir., habitat of *Th. volkovitshi*, (42) blooming *Ph. viscosa*.

Figs 43–45: Natural habitats and proved or presumed host plants of *Thamiocolus pici*, on Har Hermon, Bol'an Valley, 2000 m, 18.vi.2020. (43) Slopes of Bol'an Valley, typical landscape; (44) *Phlomis brevilabris* on the slopes under *Astragalus* sp.; (45) *Ph. brevilabris* Boiss.



Figs 46–48: Umm Zuqa Nature Reserve: (46) typical landscape, the gradient between the Mediterranean and desert vegetation clearly seen; (47) typical vegetation; (48) *Phlomis brachyodon* (Boiss.) Zohary, one of the presumed host plants of *Th. pici*.

& Hong 2004); the integument of many individuals was not fully pigmented, which suggests that the species hibernates as adults. One specimen was found by D.R. Kasparyan (ZIN) in northern Tuva on June 1, 1975; this also implies overwintering adults and may be expected in *Th. wittmeri*.

Thamiocolus tataricus (A. Schultze, 1900)

(Fig. 26)

Ceutorhynchus tataricus A. Schultze, 1900: 44.
Ceutorhynchus hispidirostris Iablokoff-Khnzorian, 1971: 190, **n. syn.**

As the number of specimens was not reported in the original description, the only specimen from the A. Schultze collection (NHMB), is here designated as the lectotype. The specimen was examined in the G. Frey Museum in München by the first author. It is a 3.5 mm long female with the following labels: (1) "♀", (2) golden square, (3) "*C. tataricus* Schultze Turkest." (handwritten by A. Schultze), (4) "Type" (pink, printed), (5) "Sammlung Aug. Schultze" (printed), (6) "*C. tataricus* Schultze Turkest." (handwritten with double black bordering). The type is glued on a narrow point, the claw-segment in 3 tarsi is missing.

Thamiocolus hispidirostris was described by Iablokoff-Khnzorian (1971) from Kondara Gorge in Tajikistan some 30 km N of Dushanbe based on a male (holotype) and a female (paratype) in the collection of the Zoological Institute of the Armenian Academy of Sciences in Yerevan. Both types have been examined by the first author.

"Turkestan" in the original description of *Th. tataricus* is most likely Kazakhstan, which was named this way at that time, or Uzbekistan. No material from Turkmenistan has been ever seen by the first author, and the record from this country in the *Palaearctic Catalogue* (Alonso-Zarazaga *et al*. 2017) should be considered erroneous, although the occurrence of *Th. tataricus* in Kopet Dagh is not unlikely. The late E.M. Ishkov of the Institute of Zoology, Almaty, collected it in numbers from *Phlomis brachystegia* Bunge from 16 April to 7 May at altitudes of 1400–1800 m in the steppe and meadow-steppe belts with *Juniperus* L. in the Aksu-Dzhabagly Nature Reserve (Kascheev & Ishkov 2001; this record was overlooked by Alonso-Zarazaga *et al*. (2017)) in Southern Kazakhstan (formerly Turkestan Province). The species was also collected in the Pskem Mountain Range in Uzbekistan by the late E.L. Guryeva of the Zoological Institute, St. Petersburg, and in Tajikistan.

DISCUSSION

The Israeli *Thamiocolus* fauna is quite characteristic, although not particularly species rich. It is the southernmost known regional fauna of the genus and includes species with a restricted Eastern Mediterranean distribution representing four distinct lineages. *Thamiocolus wittmeri* belongs to a group of three species including also the Western Mediterranean *Th. niveus* (Chevrolat, 1859) (Fig. 3) and *Th. kerzhneri* Korotyaev, 1980 (Fig. 4) from the steppes of the Eastern Palaearctic. The composition of this group is also characteristic (Korotyaev 2008): its Mediterranean part is represented by two closely related but distinct species in the western (*Th. niveus*) and eastern (*Th. wittmeri*) parts of the region.

Thamiocolus chikatunovi n. sp. is not particularly close to any of the known congeners but shares rare characters, e. g., rather prominent lateral tubercles of the

pronotum, with the above group. *Thamiocolus pici* is the southernmost member of the group of at least three closely related species from Turkey and its eastern (Azerbaijan, Iran) and southern (Syria) neighbours. *Thamiocolus volkovitshi* is also a rather isolated species with no obviously close affinity to any other species; it is seemingly more common and more widely distributed in the Eastern Mediterranean than the remaining three species.

Interestingly, each of the four *Thamiocolus* species from Israel manifests an extreme development of the morphological features associated with adaptation to warm climate with high insolation. *Thamiocolus wittmeri* has the largest part of the dorsal surface entirely covered with contiguous, depressed medially white scales. This colour pattern probably facilitates thermoregulation and is almost perfectly repeated also in *Th. niveus* distributed at the southwestern, and in *Th. kerzhneri* at the southeastern borders of the genus range. Other species with most extensive development of the white dorsal pattern are the Canarian *Th. wollastoni* (Uyttenboogaart, 1930), *Th. garajonay* Stüben, 2014 and *Th. grancanariensis* Stüben & Schütte, 2014 (each from a different island), and *Th. candioticus* Dieckmann, 1973 from Crete and Libya. The style of the pattern is very similar in the also Canarian *Cionus griseus* Haran Lindberg & Håkan Lindberg, 1958 and in the southern Far Eastern *Cionus latefasciatus* Voss, 1956, which supports the speculated adaptive significance of the extensive white dorsal pattern in the weevils of a similar size openly living on herbs during the daytime.

Thamiocolus chikatunovi n. sp. has the lightest dark part of the dorsal pattern among the species, in which the pattern is formed by combination of areas with broad white scales on a background of narrower brown to black scales (see the description and photographs of the species with different pattern in Dieckmann (1973)). In *Th. chikatunovi* pale or mid-brown scales are noticeably lustrous, and broad white scales in the elytral bands are more abundant than in the rest species with this type of pattern usually living in the woodlands, often in the shaded forests. For example, two species in which this pattern is well developed, *Th. longicornis* Dieckmann, 1973 and *Th. sinapis* (Desbrochers des Loges, 1893), are very common in the forests of the Northwestern Caucasus near Krasnodar in Russia. In the shaded Georgian forests, *Th. imperialis* (Schultze, 1895) co-occurs with these two species (Korotyaev & Cholokava 1989: 161).

This type of disintegrating pattern is very common in the Palaearctic Ceutorhynchini associated with herbs of the families Lamiaceae (*Thamiocolus*, *Datonychus* Wagner, 1944, *Coeliastes* Weise, 1883, *Sinocolus* Korotyaev, 1996), Asteraceae (*Hadroplontus* Thomson, 1859, *Microplontus* Wagner, 1944) and Boraginaceae (*Mogulones* Reitter, 1916). Most species of these genera have a contrasting pattern of the dorsal surface and dense vestiture of snow-white scales on the underside with several small or medium-sized black spots along the sides. This pattern is considered an effective mean of disorientation of the predators in dermestids, first of all by species of the genus *Dermestes* Linnaeus, 1758 (Zhantiev 1976): when

a beetle with a black dorsal surface split by a wide light band falls on the ground with its venter up, the predator suddenly sees a white figure with excised margins. In many ceutorhynchines associated with Lamiaceae and Boraginaceae this type of the pattern closely corresponds to that in several *Dermestes* spp. Since beetles associated with these plants spend long time on the ground at the stems of their hosts, often next to the common (in temperate Europe) *Dermestes laniarius* Illiger, 1801, we assume a similar adaptive function of their patterns.

Noteworthy, the contrasting disintegrating pattern is unknown in amphibiotic Ceutorhynchini. For example, two species developing in semiaquatic plants—*Datonychus angulosus* (Boheman, 1845) on *Lycopus europeus* L. (Lamiaceae), and *Mogulones raphani* (Fabricius, 1792) on *Symphytum officinale* L. (Boraginaceae)—sharply differ from the majority of the congeners in an almost uniform dirty greyish brown vestiture of the entire body. In the genus *Mononychus* Germar, 1823, *M. punctumalbum* (Herbst, 1784), living on often standing in water irises, has a uniform vestiture, whereas *M. ireos* (Pallas, 1773) and *M. schoenherrii* Kolenati, 1859, occurring in dry saline habitats, have the elytral pattern sharply contrasting. A similar type of the dorsal pattern is common in the high-mountain xerophilic Ceutorhynchini. Iablokoff-Khnzorian (1964) once distinguished a group of three species from different genera, *Prisistus nivalis* (Iablokoff-Khnzorian, 1964) from a locality at 3000 m asl on Mt. Aragats, *Datonychus sunicus* (Iablokoff-Khnzorian, 1964) and *Mogulones cacciniae* (Iablokoff-Khnzorian, 1964), from low to mid-elevations in xeric landscapes, based mainly on this character.

In species from xeric and alpine landscapes, a unicoloured, usually grey or light brown to sulphur-yellow dorsal pattern is more common. In the south-west of Eastern Siberia, a characteristic distribution of the dorsal pattern over altitudinal belts is demonstrated in the *Thamiocolus* species from the middle-mountain taiga belt on the southern slope of West Sayan Mountains in Krasnoyarsk Territory and Tuva to the desert steppe in central Tuva and dry steppe in southern Tuva. In the taiga landscape from about 1200–1800 m asl, three species occur on *Phlomis tuberosa* L.: *Th. sahlbergi* (C.R. Sahlberg, 1845) with a well-developed elytral pattern composed by white oval scales in addition to narrower brown and white or greyish scales of the background; *Th. virgatus* (Gyllenhal, 1837) with a less contrasting white and brown pattern formed only by brown and white narrow scales; and *Th. nubeculosus* (Gyllenhal, 1837) with a pattern similar to that in the preceding species but less contrasting and often ill-defined. The first two species do not occur below the lower margin of the mountain taiga except *Th. virgatus* found in a flood plain in an adjacent part of the steppe depression. *Th. nubeculosus* occurs in a semi-desert with *Nanophyton erinaceum* (Pall.) Bunge north of Kyzyl at about 700 m and throughout the steppe zone of the Tuvinian Depression. In the mountain taiga belt, it occurs only on the warmest dry steppefied areas. In addition, *Th. kerzhneri* occurs in Tuva; it is rare on *Panzerina lanata* (L.) Soják in the mountain steppe of the Turano-Uyuk Depression adjacent to West Sayan Mts at elevations of about 900 m and in the dry steppe of the Ubsu-Nur Depression in southern Tuva at about 1300 m. In the latter

place, *Th. sulphureus* (Faust, 1885), with the body entirely covered with broad sulphur-yellow scales (Korotyaev & Hong 2004, as *Th. gobicola* Korotyaev, 1980), co-occurs with *Th. kerzhneri* on *Panzerina lanata*. *Thamiocolus kerzhneri* is known as far southward of southern Transbaikalia as southwestern (Govi-Altai aimag), southern (Bajan-Khongor aimag) and southeastern Mongolia (Korotyaev 1980), and as far eastward as Beijing and North Korea (Korotyaev & Hong 2004). Further east of Tuva in Eastern Siberia, in the Republic of Buryatia, only *Th. sahlbergi* and *Th. virgatus* were found on *Phlomis tuberosa* on the flood plains in the middle taiga subzone, and the latter species also in the Barguzin Depression where it occurs in the northernmost variant of the Mongolian-type steppe. *Thamiocolus nubeculosus* is present in the steppefied areas of the southern part of the middle taiga subzone, but *Th. kerzhneri* does not occur on *Panzerina lanata* common on the steppe slopes of the Barguzin Valley, and is known only from the steppe zone in the southernmost part of the region near Kyakhta (Korotyaev 1980).

Another example that demonstrates prevalence of a less contrasting dorsal pattern in arid regions may be found in Middle Asia. The only diversified species group of *Thamiocolus* there comprises the endemic *Th. fischerianus* Korotyaev, 1980, *Th. brisouti* (Faust, 1888), *Th. kirgisicus* Korotyaev, 1980, *Th. lopatini* Korotyaev, 1980, *Th. schultzeanus* (Reitter, 1901) and *Th. zaslavskii* Korotyaev, 1980, all with at best moderately contrasting dorsal pattern. The only other endemic species are the uniformly grey *Th. tataricus* (Schultze, 1900), uniformly sulphur-yellow *Th. sulphureus* (Faust, 1885) and *Th. gobicola* Korotyaev, 1980. The only species with a contrasting dorsal pattern, *Th. phaleratus* Colonnelli, 1997 from Kopet Dagh in Turkmenistan, is found in a forest at an elevation of 1500 m; it is related to the South-Eastern European forest species *Th. imperialis* (Schultze, 1895). The genus *Microplontus* is represented in the mountain Middle Asia by one endemic species, *M. helenae* Korotyaev & Nasreddinov, 2017, with a uniformly pale olive-coloured vestiture of narrow scales. The same type of vestiture have all six species of the Middle Eastern genus *Boragosirocalus* Dieckmann, 1975 associated with xerophilic Boraginaceae and apparently derived from *Mogulones.* The only member of the southwestern Turanian (= desert Middle Asian) genus *Tatyania* Korotyaev, 1988, *T. succinea* Korotyaev, 1988, is a miniaturized derivate of *Thamiocolus* with a 5-segmented antennal funicle, depigmented integument and sparse and fine uniform yellowish vestiture; it lives in the Turkmenistan deserts on a labiate, *Chamaesphacos ilicifolius* Schrenk of the tribe Stachydeae, to which all known hosts of *Thamiocolus* belong.

As it has been shown above, a contrasting pattern of the dorsal surface tends to be replaced by a uniform whitish, grey or yellowish (sand-colored) coloration in xeric landscapes. Two of the *Thamiocolus* species in Israel have a uniform vestiture of narrow light scales.

Thamiocolus pici has the vestiture so reduced that the beetles look bare; the elytral sculpture is fine, and the dorsal surface is lustrous. This is also one of the features common to many Ceutorhynchini in xeric landscapes and is manifested in large

groups of species in the genus *Ceutorhynchus* formerly attributed to the subgenera *Dionorenus* Reitter, 1916 and *Marklissus* Reitter, 1916, but subsequently recognized as compound groups combining members of different lineages that acquired similar adaptive features – a smooth and lustrous integument (in many *Dionorenus* spp. with varyingly dense vestiture of large white scales). There is another ceutorhynchine in Israel with this 'xeric syndrome' perfectly developed, *Glocianus sericellus* (A. Schultze, 1900). It has a strongly lustrous dorsal surface, which in most congeners is moderately densely clothed with narrow, predominantly dark brown scales and scattered pale scales forming no distinct pattern, the latter being represented only by white or yellow short rectangular scutellar spot. Interestingly, the lustrous, metallic-shining elytra occur both in xero- and mesophilic species of large genera (*Ceutorhynchus* and *Aulacobaris* Desbrochers, 1892) of the two supposedly allied supertribes Ceutorhynchitae and Bariditae, associated with crucifers. Thus, apparently this morphological feature is not associated primarily with the xeric environment.

Thamiocolus volkovitshi has the vestiture uniform, but fairly dense and composed of relatively wide elongate scales, largely concealing the integument dorsally and producing grey appearance of the beetles. The underside has the vestiture not found in any other Palaearctic ceutorhynchine being formed of very short and broad scales with finely dissected plumose margins. The antennal club in this species is unusually short and widely blunted at the apex, the apical segments of the antennal funicle are shorter, and, together with the club, are more densely covered with longer setae. Fine pubescence of the tarsi is also longer and denser than in the other species and is present, and denser, on the ventral surface of the claw-segment, which may help prevent sticking the legs and antennae to the glandular pubescence of the stem and leaves of the host plant, *Phlomis viscosa*. This species has tarsi narrower and shorter than in all other *Thamiocolus*; narrow tarsi are another characteristic feature of many xerophilic weevils perhaps reducing evaporation through the hairy ventral surface of tarsal segments. Although obviously associated with the type of the substrate, it often correlates with the longitudinal distribution of weevils; the tarsi in xeric inland regions are narrower than in their relatives from the oceanic sectors (Korotyaev & Gültekin 2003). In the three species of the *Th. niveus* group, the 3rd tarsal segment in *Th. niveus* and *Th. wittmeri* is about as wide as long, but is noticeably narrower in the predominantly Central Asian *Th. kerzhneri* occurring also in Northeastern China and in North Korea (Korotyaev & Hong 2004).

Climatic distinctions may, of course, be mediated by physiological and behavioural mechanisms, but many morphological features obviously associated with adaptation to xeric environment are here presumed significant to insects.

Finally, species with very different types of the dorsal pattern may co-occur on the same host. This was observed by the first author in late August of 1980 in southern Tuva, where *Th. kerzhneri* and *Th. sulphureus* occurred in numbers on flowering *Panzerina lanata* (Korotyaev & Hong 2004; as *Th. gobicola* Korotyaev, 1980). The behaviour of the two species in the sweeping net was different. *Thamiocolus*

sulphureus quickly ran and flew away in the warmest hours but moved quite slowly in the morning and close to the sunset, whereas *Th. kerzhneri* moved at about the same speed throughout the day. Interestingly again, *Th. kerzhneri* and *Th. gobicola* were found together on the same plant at the southern boundary of their ranges in the Trans-Altai Gobi Desert in Mongolia (Korotyaev & Hong 2004).

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